Table 6-118 lists the estimated quantities of primary materials for the upgrade of Nevada highways for the Apex/Dry Lake route. These quantities are not likely to be very large in relation to the southern Nevada regional supply capacity (see Section 6.3.3.1).

**Table 6-118.** Utilities, energy, and materials required for upgrades along the Apex/Dry Lake route.

| Route | Length (kilometers)[a] | Diesel fuel (million liters)[b] | Gasoline (thousand liters) | Asphalt (million metric tons)[c] | Concrete (thousand metric tons) | Steel[d] (metric tons) |
|---|---|---|---|---|---|---|
| Apex/Dry Lake | 182 | 1.6 | 29 | 0.23 | 0.1 | 2.3 |

a. To convert kilometers to miles, multiply by 0.62137.
b. To convert liters to gallons, multiply by 0.26418.
c. To convert metric tons to tons, multiply by 1.1023.
d. Steel includes rebar only.

*Operations.* Section 6.3.3.1 discusses the utilities, energy, and materials needs for the operation of an intermodal transfer station.

Fossil fuel that would be consumed by heavy-haul trucks during operations is discussed in Chapter 10, which addresses irreversible commitments of resources.

### 6.3.4 ENVIRONMENTAL JUSTICE IMPACTS IN NEVADA

The analysis considered existing highways and railroads that DOE would use in Nevada—I-15, the proposed Las Vegas Beltway; U.S. 95; five possible highway routes for heavy-haul trucks; the Union Pacific Railroad's mainlines in northern and southern Nevada; and five corridors with variations for a possible branch rail line in the State. If DOE constructed and operated the repository, it would use combinations of these routes for shipments of spent nuclear fuel and high-level radioactive waste. DOE would use alternative preferred routes designated by the State of Nevada for highway shipments to the repository.

In general, the consequences of using a transportation route would occur close to the route. Thus, for transportation on a highway or railroad to affect a census block group for which environmental justice concerns could exist, the route would have to cross or be adjacent to the block group. Chapter 3, Section 3.1.13 discusses and depicts the minority and low-income populations in Nevada.

Portions of some routes would cross or be adjacent to Native American tribal lands. Existing or proposed highway routes avoid census block groups with high fractions of minority, low-income, or Native American populations with the exceptions of:

- Sections of I-15 that pass through the center of the Moapa Reservation northeast of Las Vegas, Nevada
- A 1.6-kilometer (1-mile) section of U.S. 95 across the southwest corner of the Las Vegas Paiute Indian Reservation that could be used by legal-weight trucks as well as either the Caliente/Las Vegas or Apex/Dry Lake heavy-haul truck route
- The Caliente/Las Vegas and Apex/Dry Lake routes for heavy-haul trucks, which would pass near the Moapa Reservation
- Sparsely populated areas of census block groups in the northern parts of Clark County

Existing or proposed rail routes could cross census block groups with high populations of minority, low-income, or populations of Native Americans only at the following points:

- The Union Pacific Railroad's mainline tracks pass through the center of the Moapa Reservation and through the center of Las Vegas, Nevada, crossing census block groups with high fractions of minority and low-income populations.

- The Bonnie Claire Alternate of the Caliente and Carlin Corridors would pass through 4.5 kilometers (2.8 miles) covering 1.8 square kilometers (450 acres) of the Scottys Junction portion of the newly designated Timbisha Shoshone Trust Lands parcel planned for residential use and tourist-related business.

Also, a branch rail line in the Valley Modified Corridor would pass near the Las Vegas Paiute Reservation. None of the potential intermodal transfer station sites that DOE could use would be near a census block group with high minority or low-income populations, but an intermodal transfer station in the Apex/Dry Lake area could be as close as about 3 kilometers (2 miles) to the Moapa Reservation.

Impacts to resource areas other than environmental justice along Nevada highways and railroads from the transportation of spent nuclear fuel and high-level radioactive waste would be small. The number of shipments in the mostly legal-weight truck and mostly rail scenarios would be small in comparison to the number of all other commercial shipments in southern Nevada. For comparison, under the mostly legal-weight truck scenario as many as five trucks carrying spent nuclear fuel would pass through the Moapa Indian Reservation on I-15 each day compared to daily traffic of more than 3,000 commercial trucks that use this section of highway (DIRS 156930-NDOT 2001, p. 6; DIRS 104727-Cerocke 1998, all). Under the mostly rail scenario as many as 11 railcars per week carrying spent nuclear fuel could travel into southern Nevada compared to about 1,000 railcars each day for other commodities. Thus, impacts from truck and rail traffic and emissions would be small for these shipments. The potential for accidents that could result in injuries or fatalities involving the shipments would also be small in comparison to the overall risk of accidents that would occur from other commercial traffic.

As much as 10 percent of travel in southern Nevada by legal-weight trucks or railcars carrying spent nuclear fuel would be through populations of Native Americans and census block groups with high fractions of minorities or low-income populations, depending on the selected route and transportation mode. Public health and safety impacts to all populations in Nevada would be small (about 1 fatality from cancer and other causes for incident-free transportation and 0.00006 latent cancer fatality for accidents over 24 years).

The public health and safety impacts to minority and low-income populations along the routes of travel would also be small. Because the probability would be small at any single location, the risk of an accident at a specific location would also be small. Thus, impacts to minority or low-income populations or to populations of Native Americans in small communities along the routes would also be small and, therefore, unlikely to be disproportionately high and adverse.

Unique practices and activities could create opportunities for increased impacts from transportation of spent nuclear fuel and high-level radioactive waste associated with the Proposed Action. One such practice could be the use of subsistence diets (that is, consumption of homegrown or naturally available plant and animal food). Because no radioactive materials would be released to the environment during incident-free transportation, the implementation of new or existing transportation routes in Nevada would not affect food sources likely to be involved in subsistence diets. If an accident resulted in the release of radioactive materials, food sources, both agricultural and subsistence, could be affected and mitigative actions would have to be taken to prevent contamination or consumption of contaminated food.

The American Indian Writers Subgroup identified noise from transportation as a concern because of its effects on ceremonies and the solitude necessary for healing and praying (DIRS 102043-AIWS 1998, p. 2-19). DOE is not aware of traditional cultural properties or other areas along the candidate rail corridors or routes for heavy-haul trucks, including variations, where noise from trains, construction of a branch rail line or intermodal transfer station, or conduct of heavy-haul or other trucking operations could interfere with conditions necessary for meditation by, or religious ceremonies of, Native Americans, with the exception of the Caliente Intermodal Transfer Station, as noted below. Similarly, no known ruins or other culturally sensitive structures have been identified that could be affected by ground vibration.

The analysis of transportation-related construction or upgrades identified potentially adverse impacts pertaining to certain routes or transportation modes. DOE could lessen some of these impacts through mitigation, as discussed in Chapter 9. Adverse impacts could include the following:

- The Valley Modified Corridor and some of its variations would involve construction in the Las Vegas Valley air basin, which is in serious nonattainment for particulate matter ($PM_{10}$) and carbon monoxide (DIRS 155557-Clark County 2001, Tables 3-8 and 5-3). Emission rates would exceed the General Conformity threshold (established by Environmental Protection Agency regulations that implement the Clean Air Act) for $PM_{10}$ for a serious nonattainment area and would qualify the construction as a major source of emissions when evaluated under the Prevention of Significant Deterioration threshold. Comparison of this corridor with known locations of minority and low-income populations indicates that effects on such populations would not be disproportionately high and adverse in comparison with effects on the rest of the population. No unique practices or pathways have been identified that would increase impacts to minority or low-income populations. $PM_{10}$ and carbon monoxide emissions are susceptible to mitigation.

- The northernmost site for a Sloan/Jean intermodal transfer station is in a $PM_{10}$ nonattainment area. Emission rates would exceed the $PM_{10}$ General Conformity threshold for a serious nonattainment area. Comparison of the Sloan/Jean route with known locations of minority and low-income populations indicates that effects on such populations would not be disproportionately high and adverse in comparison with effects on the rest of the population. No unique practices or pathways have been identified that would increase impacts to minority or low-income populations. $PM_{10}$ and carbon monoxide emissions are susceptible to mitigation.

- Most of the road upgrades for a Sloan/Jean heavy-haul truck route would occur in areas that are in attainment for criteria pollutants. However, portions of the upgrades would occur in the Las Vegas Valley air basin, which is in nonattainment for carbon monoxide and $PM_{10}$. Comparison of the route with known locations of minority and low-income populations indicates that effects from road upgrades on such populations would not be disproportionately high and adverse in comparison with effects on the rest of the population. No unique practices or pathways have been identified that would increase impacts to minority or low-income populations. $PM_{10}$ and carbon monoxide emissions are susceptible to mitigation.

- Construction and operation of a Caliente intermodal transfer station could cause aesthetic impacts to users of Kershaw-Ryan State Park. Impacts could result from construction activities and from noise, traffic, and lighting during operations. Impacts would be similar for all park users and, therefore, would not be disproportionately high and adverse for members of minority or low-income populations. Some of these impacts would be susceptible to mitigation.

- Biology and soils impacts from construction and from corridor and route occupancy and use would include long-term vegetation disturbance in corridors or at an intermodal transfer station and stopover sites. Short-term or individual impacts to threatened and endangered and special-status species could occur. The Valley Modified Corridor crosses two wilderness study areas and a national wildlife

refuge. DOE has found no location-related or unique practices and pathways information to indicate that effects on minority or low-income populations would be disproportionately high and adverse in comparison with effects on the rest of the population.

- The construction and operation of a branch rail line in the Caliente or Carlin Corridor along the Bonnie Claire Alternate would cross the Scottys Junction parcel of the Timbisha Shoshone Trust Lands. Sections 6.3.2.2.1 and 6.3.2.2.2 discuss land-use and noise consequences for potential residents. Information available to DOE indicates that the Timbisha Shoshone have not developed residential areas on the parcel. Because residential development of the parcel has not occurred, there is no population present, no way to measure the likelihood of disproportionately high and adverse impacts on a possible minority or low-income population, and no present data indicating a potential for environmental justice concerns from the Bonnie Claire Alternate.

- The construction and operation of a branch rail line in any of the candidate rail corridors could present the potential for direct and indirect impacts to archaeological and historic resources related to Native American culture. Additional archaeological surveys and ethnographic studies are needed for the placement of an alignment within any of the rail corridors, including variations, to determine specific potential impacts and mitigation needs. Records searches indicate that only a small percentage of potentially affected lands in designated rights-of-way have been inspected.

- The operation of a heavy-haul truck route along any of the candidate routes could present the potential for direct and indirect impacts to archaeological and historic resources related to Native American culture. The determination of the potential for impacts to Native American cultural values from the upgrading and use of Nevada highways for heavy-haul truck shipments would require more study. The American Indian Writers Subgroup has commented that ethnographic field studies would be necessary to determine specific potential impacts to Native American cultural properties and values (DIRS 102043-AIWS 1998, p. 4-6) for candidate rail corridors and the use of existing highways as routes for heavy-haul trucks to Yucca Mountain.

- Construction of a Carlin branch rail line could affect two known historic-period Native American cemeteries, one in Crescent Valley and the other in Grass Valley (DIRS 155826-Nickens and Hartwell 2001, p. 27).

- Several rail corridors and routes for heavy-haul trucks pass through or are proximate to significant places for Native Americans. For example, in the Pahranagat National Wildlife Refuge, the Black Canyon area, the Storied Rocks site farther south, and the Maynard Lake vicinity have been identified. The entire Pahranagat Valley is an important cultural landscape (DIRS 155826 Nickens and Hartwell 2001, Appendix A). The Coyote Springs area and the Arrow Canyon Range valley south of the Pahranagat Valley are places of cultural importance. The operation of a Caliente intermodal transfer station could have a lasting impact on the cultural integrity of the location, which Native Americans have identified as an important place. The overall significance of such places and the potential for impacts from the transportation of spent nuclear fuel and high-level radioactive waste cannot be fully understood until a rail alignment or heavy-haul truck route is identified and ethnographic field studies and consultation have been completed.

In the viewpoint of Native Americans, the construction and operation of a branch rail line would constitute an intrusion on the holy lands of the Southern Paiute and Western Shoshone. In addition, some corridors pass through or near several significant places (see Chapter 3, Section 3.2.2.1.5). The American Indian Writers Subgroup has commented that the overall significance of these places and potential impacts from operation of a rail line on them cannot be fully understood until DOE has identified the rail alignment and completed ethnographic field studies and consultations (DIRS 102043-AIWS 1998, p. 4-6). If DOE selected a rail corridor, it would initiate additional engineering and environmental studies

(including cultural resource surveys), conduct consultations with Federal agencies, the State of Nevada, and tribal governments, and perform additional National Environmental Policy Act reviews as a basis for final alignment selection and construction. DOE would address the mitigation of potential impacts to archaeological and historic sites during the identification, evaluation, and treatment planning phases of the cultural resource surveys.

For existing highways and mainline railroads, the added traffic would be minimal and shipments of spent nuclear fuel and high-level radioactive waste would be unlikely to affect land use, air quality, hydrology, biological resources and soils, cultural resources, socioeconomics, noise and vibration, or aesthetics, except as noted above. The analyses discussed in the preceding sections also determined that impacts to these resource areas from construction and operation of a branch rail line in any of the five potential rail corridors or construction of an intermodal transfer station and upgrading of highways in Nevada would be low.

Because the analyses did not identify large impacts for railroad and highway transportation of spent nuclear fuel and high-level radioactive waste in Nevada that would constitute credible adverse impacts on populations, workers, or individuals, adverse effects would be unlikely for any specific segment of the population, including minorities, low-income groups, and Native American tribes, except as noted above. Chapter 4, Section 4.1.13.4, contains an environmental justice discussion of a Native American perspective on the Proposed Action.

## REFERENCES

Note: In an effort to ensure consistency among Yucca Mountain Project documents, DOE has altered the format of the references and some of the citations in the text in this Final EIS from those in the Draft EIS. The following list contains notes where applicable for references cited differently in the Draft EIS.


102043 AIWS 1998 — AIWS (American Indian Writers Subgroup) 1998. *American Indian Perspectives on the Yucca Mountain Site Characterization Project and the Repository Environmental Impact Statement.* Las Vegas, Nevada: Consolidated Group of Tribes and Organizations. ACC: MOL.19980420.0041.

156289 ANSI 1987 — ANSI (American National Standards Institute) 1987. *American National Standard for Truckload Quantities of Radioactive Materials - Carrier and Shipper Responsibilities and Emergency Response Procedures for Highway Transportation Accidents.* N14.27-1986, reaffirmed. New York, New York: American National Standards Institute. TIC: 1495.

103072 Ardila-Coulson 1989 — Ardila-Coulson, M.V. 1989. *The Statewide Radioactive Materials Transportation Plan.* Phase II. Reno, Nevada: University of Nevada, Reno. TIC: 222209.

104926 Bauhaus 1998 — Bauhaus, M. 1998. Estimate of 1998 Concrete to be Used in the Las Vegas Area. Telephone conversation from M. Bauhaus to M. Sherwood (Nevada Ready Mix), August 7, 1998, EIS:AR-GEN-35654. ACC: MOL.19990511.0382. In the Draft EIS, this reference was cited as Sherwood 1998 in Chapter 12.